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Dramatic Results Unlikely From Replacing Phosphates

"THE LIFE of civilization in the world is measured by the reserves of rock phosphate available to make up the unavoidable yearly losses caused by civilized life."

"The removal of phosphorus from the soils of the U.S. by harvested crops, grazing, erosion and leaching greatly exceeds the addition of phosphorus to the soil. The necessity for wider use of phosphates and the conservation of our supplies of phosphates for future generations is, therefore, a matter of great public concern."

These remarks have all the flavor of contemporary pessimisms. They are, however, taken from the annual report of the Tennessee Valley Authority for 1937 and from a message to Congress by President Franklin D. Roosevelt on May 20, 1938.

Phosphates are again in the news, though not as a vindication of those gloomy prophecies. On the contrary, we now suffer from the overabundance and overuse of phosphates, the heavy fertilization of lakes and streams and the cycle of algal growth and putrefaction symbolized by Lake Erie and styled "eutrophication."

FDR IN 1938 was only half wrong. The United States is actually blessed with ample reserves of this vital mineral so that our exports of fertilizer phosphates are among the most important real values that we contribute to the world economy.

However, the industrial processes devepoped by the TVA under FDR's special encouragement have helped to make phosphates more cheaply available for industrial and agricultural uses. Even this accelerated consumption would not exhaust known reserves for hundreds of years, and as soon as these become elusive, we can look to billions of tons already located in offshore deposits on the continental shelves.

Cheap phosphates, although solving one problem for "the life of civilization," have generated others as a by-product of wasteful use. The low cost of mineral fertilizers destroys the economic base for reclaiming organic fertilizers from sewage, which is then poured into the nearest available waters. Furthermore, the use of phosphates in detergents doubles the contribution of urban sewage to the phosphate input to the lakes.

A comprehensive solution to this problem would be a radical restructuring of our systems of waste disposal and of the manuring of farm lands. We could establish standards of "tertiary" treatment that would discharge sewage carrying only a negligible residue of polluting wastes. These systems entail heavy costs that we would all have to share, although we could surely find ways of taxing identifiable polluters for their special burdens on the system.

THE DETERGENT phosphates, however, are such a conspicuous contribution to one element of water pollution that there is a certain logic and the fewest political penalties in focusing on them as a discrete evil whose removal would be relatively painless. There is still the grave danger that some substitutes, for example the NTA now being introduced, might generate even more serious problems beyond our present comprehension.

We can also ask whether the replacement of phosphates in detergents will do any perceptible good in saving the lakes. This is a very complicated question about which competent scientists honestly disagree.

Let it be clear: there is no dispute that phosphates are one of the essential inputs to the eutrophication process. The question is whether other sources of phosphate in sewage and farm runoff do not already contribute more than enough for algal growth. When phosphate is already superabundant, nitrates, other minerals or organic carbon will determine the extent of noxious growth.

These questions will not be answered by adversary proceedings where witnesses contend to extract conclusions from a hopelessly inadequate data base. They can be answered, at least in part, by further objective studies in the laboratory and the field.

My own speculation is that the public will be disappointed in all but a few areas if it expects any dramatic environmental improvement to follow from the replacement of phosphates. If this were coupled with stringent management of other phosphate sources, we could be more optimistic. My fear is of a diversion or a backlash of concern that will prevent our getting under way with really effective, but costly, methods of total management of our wastes.